

Original Article

Radiotherapy for Hepatocellular Carcinoma

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Abstract.

The facilities used include external photon RT, internal RT, and proton therapy. The most experience comes from external photon RT by linear accelerator. The striking difference in biological reserve of liver deserves special attention between the Asian patients with HCC and the American patients with liver metastasis. Although the response rate of the treated hepatic tumor reportedly ranges from 40% to 70%, the survival impact has not been extensively verified in the controlled trial. The reported patterns of failure in few studies, such as improved local control but increased extra-hepatic metastasis, were likely confounded by selection criteria of patients. Proton therapy is capable of delivering higher doses to tumor but smaller doses to liver than conventional photon RT. With the higher doses by proton, non-randomized series demonstrated promising intrahepatic control rate and even survival outcome. The radiation-induced liver disease, defined as grade 3 or greater hepatic toxicity, is frequently underestimated. The dosimetric analysis of HCC patients in Taiwan demonstrated much lower hepatic tolerance to radiation than the tolerance in the western countries. The underlying pathogenesis has been proposed as hepatitis B virus reactivation. The current data by photon RT only support its cautious use in selected patients excluded from the indications of conventional modalities, such as surgery, chemoembolization, ethanol injection, and radiofrequency ablation.

Keywords : hepatocellular carcinoma, radiotherapy, pattern of failure, radiation induced liver disease

原著論文

肝癌的放射治療

成佳憲

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中文摘要

使用於肝癌放射治療的種類包括體外光子放射治療設備，體內近接放射治療，及質子放射治療。大多數的臨床經驗來自於使用直線加速器的光子放射治療。亞洲肝癌病人與歐美肝轉移病人在肝功能背景上的本質不同。即使報告顯示肝癌放射治療的腫瘤有效率在 40-70 %，但對存活率的影響則尚未有控制良好的臨床隨機分組研究證實。值得注意的是控制腫瘤外的肝內或肝外轉移問題，這些爭議也都因各研究選擇病人間偏差而受到影響。質子放射治療可較光子治療給予更高的腫瘤劑量但更少的正常